

1 ABSTRACT OF THE DISCLOSURE.

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3 A system for hemodynamic simulation comprises a vessel having properties of
4 a blood vessel, a reservoir containing a quantity of fluid, tubing connecting the vessel and
5 reservoir, and at least one pump for circulating the fluid within the system. Fluid can be
6 tissue culture medium or blood analog fluid, and the vessel may include mammalian cells
7 attached to its inside. A drive system, comprising two reciprocating drive shafts that are
8 coupled by a cam, enables the uncoupling of pulsatile flow and pulsatile pressure to provide
9 independent control over wall shear stress and circumferential strain. The shaft drives two
10 pumps that are 180 degrees out-of-phase and are connected upstream and downstream of the
11 vessel, and effect this uncoupling.

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